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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,837	11/13/2003	Chow-Shing Shin	DEE-PT137	9513
3624	7590	04/19/2005	EXAMINER	
VOLPE AND KOENIG, P.C. UNITED PLAZA, SUITE 1600 30 SOUTH 17TH STREET PHILADELPHIA, PA 19103			PAK, SUNG H	
			ART UNIT	PAPER NUMBER
			2874	

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/712,837	Applicant(s) SHIN ET AL. 	
	Examiner Sung H. Pak	Art Unit 2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1103</u> . | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

Information disclosure statement filed 11/13/2003 has been considered by the examiner.

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-8, 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogle (US 6,466,716 B1).

Ogle discloses an optical device and a method for temperature compensation with all the limitations set forth in the claims, except it does not explicitly teach the use of a composite “plate.” Instead, it teaches the use of a composite “tube.”

Specifically, Ogle teaches: a device for temperature compensation, comprising: a composite material comprising plural fiber reinforced laminae (‘16’ Fig. 1), each of which has a designed fiber orientation (Fig. 2; column 2 lines 58-61), and having a specific temperature-dependent characteristic in a direction (column 2 lines 51-58), for compensating an optical component positioned thereon and having a temperature-dependent deformation (‘20’ - Bragg grating in Fig. 2), wherein said specific temperature-dependent characteristic is determined by said designed fiber orientation of said plural fiber laminae (column 1 line 61- column 2 line 11);

wherein said optical component includes fiber Bragg gratings (column 2 lines 51-58);

wherein said specific temperature-dependent characteristic has a designable coefficient of thermal expansion in said direction (column 3 lines 29-40);

wherein each of said plural fiber laminae is made of reinforcing continuous fibers (column 3 lines 29-56);

wherein said composite material is manufactured by consolidating a designed three dimensional array of said reinforcing continuous fibers and a matrix (column 3 lines 29-56)

wherein said matrix is a polymeric resin for binding said reinforcing continuous fibers together (column 2 lines 58-61).

Regarding claims 15-19, Ogle also discloses a method steps of ‘providing’ the structural components listed above.

Although Ogle teaches the use of a composite tube material, instead of a 'composite plate', the use of a temperature compensating plate for fiber Bragg gratings is well known and common in the art. The use of plates is well known to be advantageous and desirable in the art because it provides mechanically superior support for fiber gratings that resist bending when inadvertent pressure is applied to the optical device. Thus, the use of plates prevents signal transmission loss that may result from excessive bending in fiber gratings.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Ogle device to have a composite plate instead of a composite tube.

Claims 9-11, 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogle (US 6,466,716 B1) in view of Skull et al (US 2004/0218863 A1).

Ogle discloses an optical device with all the limitations set forth in the claims as discussed above, except it does not explicitly teach the composite material fixed in a compartment at one end and free on the other, wherein the compartment is sealed, and wherein thermally insulating material is used all around the compartment to alleviate heat conduction.

Skull, on the other hand, explicitly teaches the use of a temperature compensating material fixed in a compartment at one end ('4' Fig. 1) and the other end free (Fig. 1), and said compartment is hermetically sealed to isolate the influence of external temperature fluctuations (paragraph 0019). Also, glass solder (low thermal conducting material) is used all around the compartment to alleviate heat conduction into the compartment (paragraph 0019).

Art Unit: 2874

Skull teaches that such arrangement is advantageous and desirable because it provides superior thermal isolation of fiber grating from the external thermal fluctuations. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Ogle device to have the composite material fixed in a compartment at one end and free on the other, wherein the compartment is sealed.

Claims 12-13, 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogle (US 6,466,716 B1) in view of Bohnert et al (US 6,563,970 B1).

Ogle discloses an optical device with all the limitations set forth in the claims as discussed above, except it does not explicitly teach the use of low emissivity and high reflectivity material used on the compartment of the thermally compensating device.

However, such arrangement is known in the art, for example, as taught by Bohnert. Bohnert teaches the use of gold coating (low emissivity and high reflectivity) in fiber Bragg grating compartment (column 10 lines 11-13). Bohnert teaches that such configuration is advantageous and desirable because it provides an effective protection against unwanted external gases that may have detrimental effect on the fiber Bragg gratings.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Ogle device to have low emissivity and high reflectivity coating on the compartment housing the fiber Bragg grating.

Claims 14 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogle (US 6,466,716 B1) in view of Hu et al (US 6,366,721 B1).

Art Unit: 2874

Ogle discloses an optical device with all the limitations set forth in the claims as discussed above, except it does not explicitly teach the use of adjustable mechanism that is attached to the composite material to allow pre-tuning.

Hu, on the other hand, explicitly teaches the use of an adjustable mechanism that is attached to the composite material to allow pre-tuning ('40' Fig. 1). Such configuration is known to be advantageous and desirable in the art because it allows for accurate and precise calibration of central wavelength of reflection for fiber Bragg grating device. Thus, this configuration allows post-manufacturing fine tuning of central wavelength, resulting in a more accurate and precise optical device.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Ogle device to have adjustable mechanism that is attached to the composite material to allow pre-tuning.

Claims 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogle (US 6,466,716 B1) in view of Reese et al (US 5,993,934).

Ogle discloses an optical device with all the limitations set forth in the claims as discussed above, except it does not explicitly teach the composite material being fabricated by: providing desired shapes of prepreg of resin pre-impregnated fiber lamina, stacking fiber laminae with a designed sequence, and consolidating the stack under appropriate temperature and pressure.

On the other hand, Reese explicitly teaches the method of fabricating low CTE (coefficient of thermal expansion) laminate fabricated by providing prepreg of resin pre-

Art Unit: 2874

impregnated fiber lamina, stacking fiber laminae with a designed sequence, and consolidating the stack under appropriate temperature and pressure (column 3 line 28- column 4 line 44). Such configuration is considered advantageous and desirable because allows for consistently repeatable manufacturing steps for producing high strength composite fiber material. Consistent and reliable manufacturing steps increase production yields and decreases production cost.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the Ogle device to have composite material fabricated by providing desired shapes of prepreg of resin pre-impregnated fiber lamina, stacking fiber laminae with a designed sequence, and consolidating the stack under appropriate temperature and pressure, as shown in Reese.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sung H. Pak whose telephone number is (571) 272-2353. The examiner can normally be reached on Monday- Friday, 9AM-5PM.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



Art Unit: 2874

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sung H. Pak  
Examiner  
Art Unit 2874

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